

Viking data puzzles JPL's biology team

Scientists were preparing to check at Roundup press time some puzzling data from the Viking 1 lander which suggests a possibility of life on Mars.

The biology team at the Jet Propulsion Laboratory, Pasadena, Calif., were planning a control experiment, results of which are expected by Aug. 23.

Last Sunday, the pyrolytic release experiment, which looks for carbon assimilation by micro-organisms, showed a radioactive curve six-times higher than anticipated.

Dr. Harold Klein, chief of the biology team, said those results "suggest at least the possibility of biological activity in the sample being incubated."

"It's a tantalizing result, no question about that," Klein said,

but "right now we have half the information we need."

"It is entirely possible that some unsuspected instrument malfunction or inherent chemical property of the surface material" is responsible for the results, the scientist cautioned.

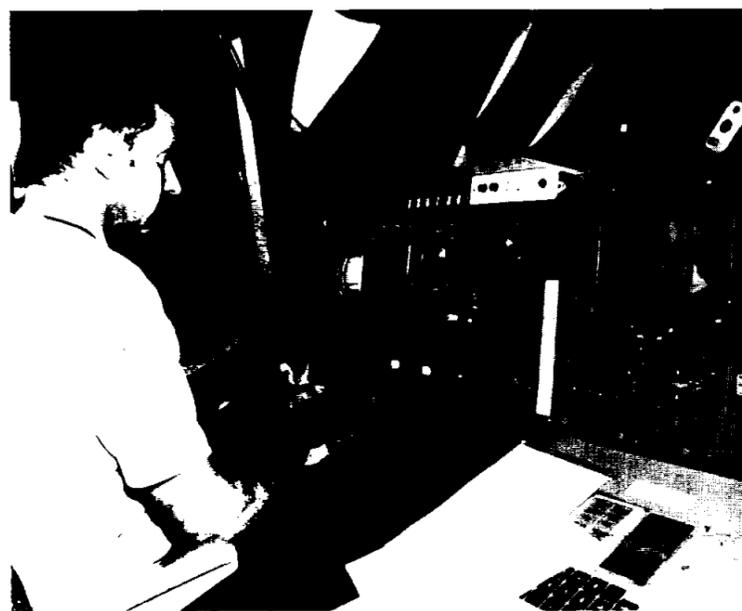
Another puzzling result came from the labeled release experiment when the Martian soil in its test chamber showed a second surge of radioactivity when more nutrient was added.

In the control experiment, the soil will be sterilized first to eliminate any organisms. Then the tests will be repeated.

Meanwhile, Viking 2 continues its orbit of the red planet in preparation for the landing of a second robot, Sept. 4.



VISITING FROM HQ — NASA's new deputy administrator, Dr. Alan M. Lovelace, right, is briefed on the MOCR operation for Shuttle Approach and Landing Tests by DSAD Director Howard W. Tindall, Jr., left, JSC Director Christopher C. Kraft, Jr., and Samuel D. Sanborn, Systems Engineering Branch head for DSAD's Ground Data Systems Division. Lovelace visited JSC July 30.

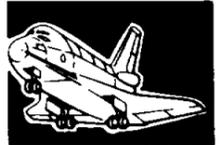


CHECKING SYSTEMS — ALT Crew Commander Joe H. Engle evaluates the Shuttle Flight Control Systems on the Crew Procedures Evaluation Simulator. Engle and crewmate Richard H. Truly, pilot, comprise one of two crews which will participate in various phases of Orbiter test and checkout at the Dryden Flight Research Center in California.

ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS



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JSC accepts computer system Complex drives Shuttle simulators

A milestone in preparations for the Space Shuttle program was reached July 26 with the acceptance of the Univac 1100/46 Computer System, a sophisticated computer complex that will drive the Shuttle Mission Simulators.

"Prior to acceptance, thirty days of round-the-clock testing was conducted here at the NASA Johnson Space Center and the computer complex operationally demonstrated reliability far in excess of

contractual requirements," said Dr. Bruce B. Johnson, technical manager of the contract.

Completed three weeks ahead of schedule by the Sperry Rand Corp., Sperry Univac, the Univac 1100/46 consists of ten processors, making it one of the most powerful digital computers built to date.

Center Director, Dr. Christopher C. Kraft, Jr., was present for the acceptance ceremonies of the Shuttle Mission Simulator Computer Complex and presented group achievement awards to the Sperry Univac and NASA Project Teams for a job well done.

Following acceptance the Univac 1100/46 was turned over to Singer, Simulation Products Division for software development and integration into the Shuttle Mission Simulators.

The simulators will be used to train flight crews and ground personnel in all phases of the Space Shuttle program.

The computer, a multipurpose processing system, will simulate a wide range of mission situations associated with major flight phases including: pre-launch, ascent, aborts, orbit rendezvous, docking, payload handling, undocking, de-orbit, entry, landing and rollout on

the runway.

In March 1978, the SMS will begin supporting all flight phases and modes of operation including operating in an integrated mode with the Mission Control Center.

Last chance for banquet reservations

Summer employees have until 4 pm Monday, Aug. 16, to make reservations for the upcoming annual Summer Employees Banquet.

Dr. Josephine Sobrino, director of Professional Education at the University of Houston at Clear Lake City, will be the featured speaker at the luncheon to be held at 11:30 am, Aug. 23, at the Gilruth Recreation Center.

Summer Aids, VOE's, ICT's and Junior Co-ops, their supervisors and their parents are invited to attend.

Price of the luncheon is \$3.80 for roast beef and \$2.90 for baked chicken. Reservations must be prepaid. For more information, contact Mrs. Wanda Thrower, Summer Aid coordinator, ext. 3734.

NASA satellite aids world poor

NASA's most advanced communications satellite, ATS-6, is now employed in a three-month demonstration of how space and other advanced technologies can be used to benefit the people of developing countries.

As many as 30 countries in Asia, Africa and Latin America are ex-

pected to participate in the project, begun Aug. 1, which is being undertaken jointly by NASA and the Agency for International Development.

The experiment will demonstrate how the application of space communications, remote sensing from earth resources satellites and high-resolution aerial photography can help some of the world's poorest people boost food production, improve health and nutrition, expand family planning projects and raise income levels.

ATS-6 will beam audio or audio-visual presentations, both live and filmed, to special receivers set

up by NASA on the ground, including some in remote areas.

Plans also call for placing a transmitter-receiver in the capital of each participating country to allow two-way discussion between representatives from the US and the participating country.

Until the end of July, ATS-6 had been on loan to the Indian government for one year and had served as a transmission point for information on family planning, farming, nutrition and health measures into remote villages.

ATS-6 was used for communications relay for the Apollo-Soyuz Test Project.

SBA loan deadline approaches

The Small Business Administration wishes to remind June 15 flood victims that there is only one week left to return applications for disaster loans. Thursday, August 19, is the last day that applications can be accepted for these low-interest, long-term loans.

Applications can be accepted for flood damages to homes, businesses, personal property, or motor vehicles, less any insurance, Red Cross or State grant money received or expected. These applications should be taken to the SBA Disaster Office at 2320 LaBranch, Room 2115, between 8:00 a.m. and 5:00 p.m., Monday through Friday, until 5:00 p.m. August 19.

Weather watcher eyes hurricanes

Gulf Coast weather forecasters now have a new "eye in the sky" helping them keep watch for budding hurricanes.

The seventh ITOS operational weather satellite, ITOS-H, was launched into orbit July 29 from the Western Test Range at Vandenberg AFB, Lompoc, Calif.

ITOS was designed and developed by NASA for the National Oceanic and Atmospheric Administration of the Department of Commerce. It has been renamed NOAA-5 and joins NOAA-4 and NOAA-3, currently in orbit.

Its immediate duties include hurricane watch over the Gulf of Mexico, the Caribbean, and the Atlantic and Pacific oceans.

In addition to producing cloud cover pictures of a given location on the globe twice daily, the RCA-built satellite will transmit global atmospheric temperature soundings.

The satellite will generate as many as 1,400 useful temperature readings daily, from sea level up to an altitude of 20 miles. From these, meteorologists can infer the moisture content of the atmosphere.



MANAGEMENT GRADUATES — Receiving their certificates of completion recently were participants in the fourth JSC Management Development Program. The special two-year program, taught on-site, includes four graduate-level university courses in organizational behavior and management. Shown (l to r, back row) are graduates Robert Polifka, Dean Cubley, Carrington Stewart, Arturo Campos and Norman Chaffee and Dr. W. E. "Dutch" Holland, MDP director. In the front row are Thomas Mancuso, Clair Nelson, James McBarron, John Smith, Jack Stanley and Ann Sherman. Not pictured are Gary Johnson and Dan Mangieri. The program is administered by the Employee Development Branch, JSC Personnel Division.

Elizabeth Hill of COD earns certified rating

Elizabeth Hill of the Center Operations Directorate has become a Certified Professional Secretary (CPS).

After completing the Certified Professional Secretary Review course, Hill successfully passed the CPS examination in July.

"A CPS rating represents one of the highest honors awarded in the secretary profession," she said. Hill said, she enrolled in the course in an effort to develop professional capabilities as a career secretary.

She added, the course prepared one in all aspects of management — especially management problems.

Upon completion of the two semester course, Hill said, the student is prepared to take the two-day, six part examination consisting of business and public policy, communications and decision making, financial analysis and the mathematics of business, human relationships and the economics of management.

"Human relationships was the most interesting aspect of the course because I enjoy helping and working with people," she said.

So difficult and all encompassing is the CPS examination that candidates are given five years to pass. The examination is developed and administered by the Institute for Certifying Secretaries, composed of representatives from management, business education and the National Secretaries Association.

According to Carol Smith, NSA president at Clear Lake, a secretary

is defined as an executive assistant who possesses a mastery of office skills, who demonstrates the ability to assume responsibility without direct supervision, who exercises initiative and judgment, and who makes decisions within the scope of assigned authority.

The University of Houston at Clear Lake and the Clear Lake chapter of the National Secretaries Association (NSA) will co-sponsor the CPS Review Course at the Clear Lake campus during the fall and spring semesters.

Also receiving their CPS ratings were JSC contractor employees Georgia Yawn of Lockheed Corp. and Shirley Williams of A-V Corp.



Elizabeth Hill

Tickets, promotions represent major EAA employee service

(In February, the EAA surveyed JSC employees concerning their interest and participation in various activities and facilities. This is the fourth in a series of reports stemming from that survey.)

The sale of tickets, either at regular or discounted prices, and the various promotions offered or supported by the EAA represent a major effort.

These sales and promotions, whether for entertainment, education, purchase of a product or employee welfare, are designed to give the employees of JSC and associated contractors the benefits of group participation.

The EAA does not in any way exclusively subscribe to or recommend any single agency but, rather, is passing on to the employee what is considered to be a worthwhile opportunity or cost saving.

It is up to the employees to decide whether they can benefit from the offerings. If they can obtain a better price or activity on their own, they are encouraged to do so.

Most of the cost savings offered are those available to any large business or industry. All offerings are screened by the EAA Executive Board and are not accepted if any reasonable doubt exists as to their honesty, propriety or worth.

All tickets are handled on a consignment basis only so that unsold tickets are returned. Many organizations will not provide tickets on this basis — the Oilers and Aeros, for example — therefore, their tickets cannot be handled.

For occasional events such as the Ringling Bros. Circus, Ice Capades, Jones Hall events, etc., the number of tickets sold to JSC employees seldom warrants delivery of tickets, so someone has to drive downtown or crosstown to pick them up and return unsold tickets prior to the performance. This involves either after hours time or annual leave for the individual.

Some events such as the Houston Livestock and Rodeo have no discount tickets but do provide EAA with blocks of tickets for a number of performances.

A frequent survey question was, "Why are discount movie tickets available for ABC theaters and not the other chains?" The two other major chains have been contacted and they do not have discount programs.

Other questions involved why tickets aren't available to Dunfey Dinner Theater and Balinese Dinner Theater. Both have been contacted and neither are interested.

The JSC Blood Bank is now the largest in the Southeastern US. Through the combined efforts of JSC employees and contractors there is at least one blood drive every month. The schedule and contacts are listed in the new JSC phone book on Page 50.

The survey indicated that employees find the *Roundup* the best source of information concerning EAA events, followed closely by the special flyers. (See chart.)

Special efforts will be directed to these two media with the work area bulletin boards as a back-up.

The cafeteria bulletin boards will be abandoned since their usage does not warrant the effort required to maintain them.

Any questions or suggestions regarding tickets or promotions may be directed to the EAA at ext. 2310.

Smith heads secretary association

Carol Jean Smith, secretary to the deputy director, Center Operations, has been elected president of the NASA Clear Lake Chapter of the National Secretaries Association, International.

Smith and her new vice presi-



Carol Jean Smith

dent, Georgia Yawn, CPS, of Lockheed Electronics, recently were delegates to the NSA international convention held at the Hyatt Regency in Houston.

Other new officers include Bernice Woolsey, CPS, of Marine Equipment Co., recording secretary; Phyllis Barrow of Lockheed, corresponding secretary; Virginia Thomas, CPS, of Oxirane Chemical Co., treasurer; Alma Hurlbert of the VA Hospital and Yvette Crane of Duraclean by Crane, directors.

Giving credit

Roundup reporter Bruce Bennett, a cooperative education student from Texas Southern University, wrote the article in the July 30 *Roundup* about American Indian summer interns.

The editor had intended to give Bennett a deserved by-line on the article. It was inadvertently omitted.

EAA PROMOTIONS SURVEY RESULTS		
	YES	NO
1. I find the Roundup articles helpful in keeping up with EAA events.	1009	55
2. The special flyers have been helpful as a reminder of events.	999	59
3. The bulletin boards in the cafeterias have been helpful and informative.	391	549
4. The bulletin boards in work areas have been helpful and informative.	748	266
5. I have been adequately informed about EAA activities through the above media.	865	149

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ECONOMIZE**



**SEND YOUR
COST REDUCTION
CONTRIBUTIONS
TO BH4**

**BE SURE TO USE
NASA Form 1105A**

John Dabbs services held in S. C.

Funeral services for John H. Dabbs, a section head in the Engineering Development Directorate, were held last month in Sumter, S.C.

Dabbs, of Friendswood, passed away here July 7. He was 40 years old. Memorial services were held at Friendswood Methodist Church, July 9.

An engineering graduate of the University of South Carolina, Dabbs was assigned to NASA in Hampton, Va., for four years before moving to Houston in 1962.

Survivors include his wife, Ethel Brown Dabbs; a son, John Jr., and daughter, Tina, all of Friendswood.

The family requested donations in his memory to the American Cancer Society.

ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS

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Photographer: A. "Pat" Patnesky



BLAZING TO VICTORY — The NASA Blazers women's softball team going to the national Class A championship tournament includes (l to r, back row) Coach Don Smith, Sandra Morris, Ann Codianne, Sandie Campbell, Mary Kubena and Head Coach Rennie Waund. Middle row — Linda O'Brien, Manager Reita Smith, Julia Hebbe and Debbie Wolfgram. Front row — Kathy Tamer, Carolyn Waund, Annette Aldape, Lynda Pierson and Debbie Aldape. Not pictured are Janie Stroup and Sherri Coats.

They're Houston champs

Blazers go to nationals

The NASA Blazers women's softball team will compete in the Class A National Championship tournament in York, Pa., Sept. 3-6.

The Blazers will be the only Texas team entering that competition with other ball clubs from the US, Canada, Mexico and Puerto Rico.

The local team advanced to the nationals by emerging as champions of the 1976 Metro Houston Class A Slow Pitch Tournament.

In a hard-hitting contest, the Blazers clinched that championship July 26, by defeating Tenneco, 9-3.

That game concluded an outstanding tournament for the Blazers

in which they outscored their opponents, 58-10. The team won five straight games en route to their first place finish.

The Blazers, sponsored by Ramada Inn and JJ's Sandwich Shop, defeated Steak N' Ale, 27-0; Spring Branch Gasket Co., 13-2; the Swingers, 3-2, and Fidelity Printing, 6-3.

Prior to the Houston tournament the Blazers had a win-loss record of 140-31 for the three years since they organized.

Leading the Blazers to victory have been Rennie Waund, head coach, and Don Smith, coach.

Terry Gates is medic and score-keeper and Reita Smith is manager.

Members of the team are Debbie Aldape, Sandie Campbell, Sherri Coats, Ann Codianne, Julia Hebbe, Mary Kubena, Sandra Morris, Linda O'Brien, Lynda Pierson, Janie Stroup, Kathy Tamer, Carolyn Waund, Debbie Wolfgram and bat girl Annette Aldape.

The Blazers are now in the process of raising the \$4,400 needed to take the team to Pennsylvania, Coach Smith said. Interested persons may write the Blazers at 2504 San Jacinto Drive, Pasadena, Tex. 77502.

EAA ATTRACTIONS

Coming events

- Sept. 11 — Country Western Dance
- Sept. 23 — JSC Blood Drive
- Oct. 4-8 — Stop Smoking Clinic
- Oct. 16 — JSC Picnic

TICKETS

Tickets are still available for the Aug. 20 and Aug. 22, 8:30 pm performances of *Cabaret* at the Shamrock Hilton Theater Under the Stars. EAA discount is \$2.50 off the price of each ticket.

For the Dean Goss Dinner Theater comedy production *Love in E-Flat*, tickets are \$16/couple, good Thur-Fri-Sun only through Sept. 7.

No Windmill Dinner Theater tickets have been received for September.

Also available at Bldg. 11 Exchange Store, 10 am — 2 pm, are ABC Interstate theater tickets, \$1.50; free Disney Magic Kingdom Club cards and Six Flags Fun-seekers Club cards; Sea Arama adult tickets, \$3.25, children, \$2.25; and Houston Astros gift coupons, \$4 box seats, \$3.15 reserved seats.

COUNTRY-WESTERN DANCE

The second 1976 EAA Country-Western Dance, Sept. 11, will feature the sounds of the Music Masters from Kurten.

Refreshments from 7 pm — 1 am, barbecue dinner from 8-9 pm. Music starts at 9 pm.

Tickets are on sale through Sept. 3 at the Bldg. 11 Exchange Store for \$9/person.

MEN'S SOFTBALL PLAYOFFS

The Mets, the Dreamers and the Boas finished first in their respective leagues as a result of play-off games.

In the A League, the Mets and Blazers ended season play with identical 6-1 records. The Mets defeated the Blazers, 11-2, in the play-off.

B League champions were determined by a four team, double-elimination tournament between the Dreamers, Fokkers, Animals and Singer. The Dreamers took the victory with a 5-3 final win over the Animals.

In the C League, the Boas and the Heat had identical 6-1 season marks. The Boas beat the Heat, 14-10, for the championship.

OUT OF SHAPE?

The Women's Exercise Club needs members. The ladies meet Monday — Thursday at the Gilruth Center from 4:45 — 5:45 pm. The exercise room is completed and ready for use. Don't delay — attend the next meeting.

VOLLEYBALL

Registration begins Aug. 30 for mixed competitive volleyball. Money and roster are due no later than 9 pm, Sept. 8.

Women's volleyball began Aug. 2. It will continue on Monday nights through Sept. 13 with four teams participating.

Men's volleyball competition started Aug. 5 and runs on Thursday nights until Sept. 16.

FLYING BUFFS

The Aero Club is planning to offer courses in the fall, open to members and non-members. A solo course consisting of basic ground school and up to 10 hours of dual flight training, will cost about \$200.

The ground school alone is available for about \$20 and an advanced instrument ground school is planned for \$30.

An information meeting will be held at 5:15 pm, Sept. 1, in Room 206 of the Gilruth Center. Questions may be addressed to Jack Boze, ext. 3824, or Bernie Marcantel, ext. 4766.

(Continued on page 4)

Roundup Swap-Shop

Swap Shop advertising is open to JSC federal and on-site contractor employees. Goods or services must be offered as advertised, without regard to race, religion, sex or national origin. Non-commercial personal ads should be 20 words or less, and include home telephone number. Typed or scribbled ad copy must be received by AP3/Roundup by Thursday of the week prior to publication.

VEHICLES

- 75 Cordoba, org & white, wire wht covers, leather uphol, FM-stereo. xInt cond. Troxlar, 488-5059.
- 68 Pontiac Bonneville, 2 dr, a/c & pwr windows, seats. \$350. 334-2294.
- 53 Chevy, 2nd owner, good cond, 50 K orig miles, \$1800. 472-5563 or after 7, 487-2637.
- 68 Riviera, \$450. Low slide-in camper, \$410. 332-2080 after 6.
- Honda CL-70 street/dirt bike, \$125. White, 554-2916 Lg Cty.
- 68 Chevy 2-ton dump trk, 7 yd bed, \$3100. Siggins, 339-2194 after 4.
- 66 Ford sta wgn, 390, auto, a/c, pwr, lug rack, good cond, 23K on new motor, \$495. 474-4094.
- 68 Flat 850 Spyder, orig owner, 48K orig miles, xInt cond. 474-4094.
- 71 Cad Sed Deville, loaded, AM/FM, xInt cond, \$2195. 474-4094.
- 72 Ponton 125cc MX, \$450. 71 Penton MX/Enduro 175cc, \$450. 71 Suzuki Savage 250cc street/trail, \$550. All privately owned, very good cond. 334-2449.
- 74 Pontiac Catalina, 4dr, air, pwr, AM, elec windows. Yellow ext, green Int. Immaculate. Forsyth, 534-3113.
- 71 Sport LeMans, auto, air, pwr, clk, vinyl top, Fenton mag whls. Orig. owner, xInt cond, \$1850. Larry, 481-6793.
- 72 Winnebago Chieftain, 24 ft, rear bath, full equip incl radials, \$10,500. 481-0446 after 4:30.
- 64 Volvo PV544, 90 hp, \$1195. Body & eng very good. 333-5166 after 6:15.
- 75 Volvo 242DL, xInt cond, 4 spd, AM/FM, air, \$4700. 474-4583.
- 73 Honda SL350K2 dirt/street bike, \$500. Bullock, 488-6095.
- 70 VW sta wgn, white, eng rebilt 14K miles ago, fine shape, reliable, runs well, \$1225. Trout, 944-3959.

- 72 Vega GT hatchback, 4 spd, radio, xInt cond, \$975. John, 483-6134 or 488-8992.
- Rent motor home, \$125/wk plus 6 cents/ml incl ins. Daily rates also. 471-5161.
- Boy's 20-in Sears Free Spirit spyder bike, banana seat, good cond. \$15. 333-2916.

BOATS

- Chris Craft cabin cruiser, 23-ft, depth finder, compass, 185 hp inbrd. \$2200. 334-5191 after 5 & wkends.
- 73 Venture 17 sailboat, sleeps 4, motor, head, trlr, xtras. Never in salt water. \$2950. Erickson, 649-0396.
- 16-ft Fabugas Tri-hull, 55 hp Evinrude, Big whl trlr, \$1395. 334-3461.
- 16-ft boat, 40 hp Johnson motor, new \$400 trlr, all xInt cond. All for \$1000. 641-5548, evngs.
- 75 Wellcraft Fisherman, 24-ft, w/trlr & elec winch, depth finder, VHF, compass. \$8000. 471-0879.
- 71 McKee Craft (whaler design) and galvanized sportsman trlr. 60 hp Evinrude motor. Xtras, xInt cond. \$1650. 337-1172.

PROPERTY & RENTALS

- 50 acre wooded, Trinity Co. \$525/acre, 25% down, 5 yr payout. 538-1834.
- Two bedrm apt, By-the-Sea Condominium, West Beach, Galveston. Full equip and furnished. Few summer weeks left for unusually low price of \$260/wk for firm reservation. Clements, 474-2622.
- Canal front lot at Downey's Caney

- Creek Club, Sargent, TX. Mead, 481-4870 after 5.
- Lease. Seabrook. Spacious 3-2-2 contemp, shaded, fenced, near schls. 482-5482 after 6.
- Caribbean beachfront lot, white sand and coconut trees, diving and fishing paradise. Belize, Br. Honduras. Morris, 356-1188 or 483-5925.

PETS

- AKC reg wirehair fox terrior pup. One female left. \$90. 482-0553.
- AKC reg Irish setter pups, wormed. Males and fems. Avail Aug. 28. Sharon, 925-2291.
- Silver poodles, reg, 10 wks old, wormed, weaned and shots. 946-2671 or 946-0510.
- AKC male Sheltie, 8 wks, sable, superb bloodline, \$150. Morris, 356-1188 or 483-5925.
- AKC male Sheltie, 4 yrs old, beautiful sable, house broken, Ch-sired, \$125. Morris, 356-1188 or 483-5925.

HOUSEHOLD ARTICLES

- Sewing mach, Pfaff Model 60 w/cab & attachmts, xInt cond, \$80. Naimer, 488-4211 evngs.
- 2 ea, 4X8, 3X8, 2X8 antique smoked glass mirrors, Fr Prov tables, commode, step, and 36-in scalloped marbltop tables, Span recliner, misc items. Henrietta, 481-6821 after 5.
- 36-in Vesta gas range, coppertone, xInt cond, 1 yr old. Suggs, 471-3289.
- Compact refrige, 5 cu ft, 34-in high, yellow w/wood grain top. Freeze comp. \$100. 534-2066.
- Like new, elec meat grinder w/ attachments, used once, \$25. Bunk beds,

- early Amer, good cond, \$30. Contemp org/brn/beige stripe chair, like new, \$35. 488-7698 after 5:30.
- Wing back sofa & recliner, \$25. New elec room heater, \$15. Girl's rink skates & case, size 7, \$18. 946-7548.

MUSICAL INSTRUMENTS

- Conn alto sax, \$125; Gibson ES175 guitar, \$200; steel guitar, \$40. Donohoe, 488-1432.
- King Satin Finish Silver Baritone Horn. Just overhauled, xInt. cond. 482-7990 after 5 wkdays.
- Clarinet, La Blanc, Normandy, 18 mo old, school approved, \$150. 474-2906 after 6.
- Normandy clarinet, \$30. xInt cond except needs new pads. Edi, 334-5170 after 5.
- Trombone, King Tempo, \$75. Ratisseau, 473-2583.
- Player piano, reconditioned, refinished. Electrified w/mandolin (rinky-tink) attachmt. Plays perfect. 488-1890.

WANTED

- One person to join carpool from SW Houston. Kamen, 771-9847.
- Used drillpress, 6-in jointer, metal lathe. Muhly, 471-3762.
- Female roommate to share 2 bedrm/2 bath townhouse, NASA area. Must be neat, reliable, over 18. Joyce, 644-2366 or 774-1846.
- Rider to Michigan or anywhere betw. Leave soon after Sept. 10. Greenwell, 483-3532 or 334-3125.
- Living rm or den suite in very good cond. 474-2081.

MISCELLANEOUS

- QUAD, box type, fiberglass spreaders, incomplete wiring. W2AU balum incl. \$25. Eggleston, 334-2897.
- Elec mower, good cond, \$30. 474-2906 after 6.
- CB set Radio Shack's top SSB model, Navajo TR57. Lists \$399. Sell \$250. 641-5548 evngs.
- Indian ring, woman's or boy's size 7, contemp sterling setting, genuine turquoise and mother-of-pearl. New Mex Indian handcrafted. \$30. 333-2717.
- Sonar D-60 solid-state depthfinder w/xducer, in orig carton, \$85. White, 544-2916 LgCty.
- English forward seat saddle, Crosby Torino, xInt cond. \$220. 482-3104.
- 25-in Packard Bell color TV, \$399. Beautiful early Amer cabinet. Perfect, less than 1 year old. 471-3762.
- 36K BTU GE central cooling/hting system, complete. New furnace never used. \$200. Bell, 334-3227.
- Justrite 3-gal safety can, still in ctn. \$15. 534-2066.
- Radio-cntrld model airplane eng, ENYA 60 III Model 7033. New, never used. Cost \$80. Sell \$60. Hill, 471-1695.
- 2 Carol Shelby 8-1/2X15 mag whls, like new. Cost \$65 ea. Sell \$37.50 ea. 1 good F60-15 tire free w/prchse. 334-2449.
- White paint, 3 gals. Ext satin finish, acrylic latex. Sears Weatherbr No. 33015. \$8/gal. Rubenstein, X 5461.
- Hospital bed w/siderails, manual crank, \$125. Reeves, X 7272.
- Celestron 10 telescope w/clock drive, Unitron finderscope, eyepieces, extras, \$1250. Erickson, 488-1901.
- Camper cover, 8-ft bed, 40-in high, vert rear door, 2 roof vents. Needs some caulking. \$50 or best offer. 481-3900.

THE PLANETS: Reflections of future Earth

By Robert S. Kraemer
Director of Planetary Programs
NASA Headquarters

In early September 1979, a robot from Earth called Pioneer 11 will dart past Saturn and its hauntingly beautiful rings to give man his first close-up look at the solar system's second largest world.

If the nuclear-powered spaceship survives its perilous brush with the colorful world and its rock-studded halo, it will carom off the planet's gravitational field for a one-day, 760,000 mile hop past Titan — a planet-sized moon of Saturn with an atmosphere about as dense and heavy as Earth's — then speed towards the outer limits of the solar system and the galactic veil beyond.

Pioneer 11's odyssey will cap an incredible 6-1/2 year, 2-billion-mile voyage of discovery, adding yet another stirring chapter to a period hailed as "a golden era of planetary exploration."

During the last several years, automated spaceships crammed with exotic instrumentation have extended man's senses beyond the Earth to every planetary body within a half-billion miles of the Sun. In 1972, a Martian explorer named Mariner 9 revealed the red planet as a dynamic world with the potential for life.

Man's first interstellar spaceship, Pioneer 10, grazed mighty Jupiter in December 1973 before hurtling outward towards the rim of infinity and an eventual rendezvous millions of years hence with the distant stars of the galaxy. Several months later, Mariner 10 slid past Venus and then sped across the solar system to visit

These mind-boggling feats of celestial acrobatics are emotionally as well as scientifically stimulating. But, as some argue, are they worth it? In an economic age distinguished by one seemingly unresolved crisis after another — shortages of energy and resources, pollution, poverty, famine, growing population — traipsing among the planets seems out of step with reality.

Happily, just the opposite is true. The newly gained capability to explore other worlds with spaceborne instruments at this particular time in history might be one of the most opportune strokes of fate ever to befall humanity.

Consider these factors. Our neighboring worlds of the solar system are undisturbed models of



Jupiter by Pioneer 10

our own planet subject to the same universal laws of physics and evolution. Moreover, they are veritable "galactic time machines" — mirrors of our own past and future. Locked within these spheres are answers to some of the most critical questions facing us today and those lurking ahead.

As everyone knows, weather is a controlling factor in the world's agriculture and a key barometer for its economic activities. Accurate weather prediction can save billions of dollars annually for farmers and businessmen and avert famine in many parts of the world.

Mariner 4, which reached Mars in 1965, revealed that heat radiation played a key role in dictating Martian weather. This factor had always been neglected in weather models on Earth. When it was added in, weather prediction improved, to the benefit of farmers and city dwellers alike.

Oceanless Mars also has provided us with a better understanding of the total weather spectrum by allowing us to observe atmospheric

patterns and shifts unaffected by large bodies of water.

Spacecraft surveillance of Venus has contributed to Earth's weather picture as well, confirming a major theory dating back to 1735. The British astronomer George Hadley, trying to explain and chart the steady tradewinds essential to sailing ships of that era, contended that a solar-driven circulation of air from the equator to the poles was the driving force behind Earth's weather.

The theory has made sense to meteorologists ever since. But proving it was another matter. Even from the vantage point offered by today's weather satellites, the cloud patterns in Earth's atmosphere are so confused by storms and cyclones that the overall Hadley-cell circulation is obscured completely.

The answer was provided two years ago when Mariner 10 zipped past Venus enroute to Mercury. Closeup photographs showed great swirling cloud patterns sweeping poleward from the Venusian equator exactly as theorized for Earth centuries ago. Enthused meteorologists predict that the Mariner 10 photographs will stand alongside Hadley's classic drawings in every meteorology textbook published for the next 100 years.

Jupiter, the largest planet in the solar system, is also beginning to contribute to a better understanding of Earth's weather. The giant world, with a volume 1,000 times that of Earth, spins its equator at a phenomenal 25,000 mph (compared to Earth's 1,000 mph). The rotational effects are so exaggerated that it may be possible to separate them from other forces that shape and drive the planet's stormy cloud belts. By isolating these factors on Jupiter, we may be able to verify theories about cloud movements on Earth that affect our weather patterns.

The recent Guatemala tragedy proved once more that an earthquake is the most destructive natural phenomenon on Earth. We know that quakes are the result of shifts in Earth's crust. But what

causes the shifts? Scientists have long held that the swirling pattern of Earth's molten core — set into motion by the planet's rapid rotation — is the driving force behind crustal movements. A by-product of the molten core's dynamo effect is thought to be Earth's magnetic field. The conclusion commonly drawn is that the strength of planetary magnetic fields is related to the speed of a planet's rotation. Rapid rotation, in turn, increases the prevalence of quakes.

This theory was badly dented by Mariner 10's flyby of Mercury. The solar system's innermost planet, it seems, has a significant magnetic field even though it rotates very slowly. Photographs of the planet's surface also revealed widespread faulting. Obviously, the Mariner 10 findings are forcing us to examine new theories on the generation of planetary magnetic fields which, possibly, will shed new light on the causes of quakes.

Earth's north and south mag-



Mercury by Mariner 10

netic poles have a tendency to wander. In fact, every 10,000 years or so they actually reverse positions. Based on an average spacing of these polar swaps, we are due for the next reversal any time now. Little is known about the causes of this phenomena or its effect on our environment, which could be considerable. Hopefully, spacecraft data on the magnetic fields of Mercury, Jupiter and, soon, Saturn will contribute more of our understanding.

One of the prime sources of cheap, inexhaustible, non-polluting

energy is thermonuclear fusion. Nuclear fusion, however, is not easily controlled. To control this awesome force, we must learn to contain plasmas, clouds of hot gases in which electrons have been stripped from the molecules.

Plasmas, because of their intense heat, are very difficult to contain for study in the laboratory. Much of our knowledge about the phenomena is coming from space where great plasma fields exist naturally. Pioneers 10 and 11 discovered plasma effects around Jupiter which were totally unexpected and which may eventually help speed the day when thermonuclear fusion will serve man's needs.

There is another side of planetary exploration, less glamorous perhaps, but important because it filters down into our everyday lives.

An excellent example of this technology transfer is the gas chromatograph-mass spectrometer (GCMS) aboard Viking 1 and 2. This amazing instrument can detect and identify complex organic molecules at concentrations as low as one part per million. Under normal conditions, an ultra-sensitive instrument of this type would fill an average-sized living room. To fit aboard Viking, however, it was necessary to fully automate it and reduce it to about the size of a car battery.

Many laboratory uses have been found for the GCMS. It has already saved numerous lives by identifying in minutes trace elements of specific drugs and poisons in the bloodstreams of patients rushed to hospital emergency wards. Most often, these have been young people suffering from drug overdose or small children and infants who have swallowed unknown poisons.

Exploring neighboring worlds is more than an exercise in curiosity. These cosmic laboratories contribute substantially to the solution of current and longterm problems on Earth, and also provide the challenge and motivation necessary for the development of tomorrow's technology.



EAA ATTRACTIONS

GET IN THE SWING

Group tennis lessons are already underway but individual and small group lessons are available from instructors Gid Weber and Jim Blumentritt. Next set of group lessons starts in September.



(Continued from page 3)

Orbiter 101:
5 weeks
to Roll-out

FIRST TRIP — Next January, Space Shuttle Orbiter 101 will take its first trip, a 32-mile overland move from Rockwell International's Palmdale, Calif., facility to the Dryden Flight Research Center at Edwards AFB. This artist's conception shows the Orbiter Transporter Strongback designed to haul the 110-ton load. The "see through" wing exposes the structure of the transporter, which has 80 wheels and weighs 10 tons.